

CLAIMS

1. A display apparatus for an automotive vehicle,
comprising:
- 5 an image display section;
a present position measuring section that measures
a present position of the vehicle;
a road map storing section that stores a road map
data image;
- 10 a superimpose processing section that superimposes
a mark representing the present position of the vehicle
on the road map data image to display the road map data
image on which the mark is superimposed through the image
display section; and
- 15 display control section that rotates the road map
data image displayed on an image screen of the image display
section in accordance with a traveling direction of the
vehicle and varies a display form of the displayed road
map data image between a region of the road map data image
- 20 which is near to a displayed position at which the vehicle
is present and another region of the road map data image
which is remote from the displayed position thereof when
rotating the road map data image on the image screen displayed
on the image display section.
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2. A display apparatus for an automotive vehicle,
comprising:
- an image display section;
a present position measuring section that measures
- 30 a present position of the vehicle;
a road map storing section that stores a road map
data image;
a superimpose processing section that superimposes

a mark representing the present position of the vehicle on the road map data image to display the road map image on which the mark is superimposed through the image display section; and

5 a display control section that rotates the road map data image displayed on an image screen of the image display section in accordance with a traveling direction of the vehicle and displays a region of the road map data image which is near to a displayed position at which the vehicle
10 is present in a display form of a video image clearer than another region of the road map data image which is remote from the displayed position thereof, when rotating the road map data image on the image screen displayed on the image display section.

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3. A display apparatus for an automotive vehicle, comprising:

 an image display section;

 a present position measuring section that measures
20 a present position of the vehicle;

 a road map storing section that stores a road map image;

 a superimpose processing section that superimposes a mark representing the present position of the vehicle
25 on the road map data image to display the road map data image through the image display section; and

 a display control section that rotates the road map data image displayed on an image screen of the image display section in accordance with a traveling direction of the
30 vehicle and controls an image displayed on the image display section, the display control section comprising: velocity calculating section that calculates one of a circumferential velocity thereof at least one given spot of place on the

displayed image screen and an angular velocity thereof on the basis of a turning velocity of the vehicle detected by the present vehicle position measuring section and a display magnification displayed on the image screen of the image display section; and a display form adjusting section that adjusts a display form of the displayed image screen of the image display section according to a magnitude of at least one of the circumferential velocity and the angular velocity calculated by the velocity calculating section.

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4. A display apparatus for an automotive vehicle, as claimed in claim 1, further comprising a display form setting table storing a variation characteristic of the display form and wherein the display control section adjustably varies the display form on the image screen of the image display section on the basis of the variation characteristic preset in the display form setting table.

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5. A display apparatus for an automotive vehicle, as claimed in claim 4, wherein the variation characteristic in the display form setting table is preset with any one of the angular velocity, circumferential velocity, a distance from a center of the rotation of the road map data image and a visual sense variation rate as a parameter.

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6. A display apparatus for an automotive vehicle, as claimed in claim 1, wherein the display form is at least one of image contrast, brightness, saturation, and focus.

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7. A display apparatus for an automotive vehicle, as claimed in claim 1, wherein, when rotating the road map data image displayed on the image screen of the image display section, the display control section controllably displays

the road map data image on the image screen of the image display section in such a manner that contents of the road map data image in the region of the road map data image which is near to the displayed position at which the vehicle is present are displayed in details and the contents thereof in the other region thereof which is remote from the position thereat are displayed in a simplification form.

8. A display apparatus for an automotive vehicle, as claimed in claim 7, wherein the display control section determines whether the other region of the road map data image is to be displayed in the simplification form with any one of an angular velocity of the rotating road map data image, a circumferential velocity of at least a given spot on the other region, a distance of the given spot from a rotation center thereof, and a visual sense variation rate as a parameter.

9. A display apparatus for an automotive vehicle, as claimed in claim 1, wherein the display control section varies the display form in such a manner as to superimpose the road map data image after the traveling direction of the vehicle is changed on that before the traveling direction of the vehicle is changed when the direction of the vehicle is changed to rotate the road map data image and to vary gradually a superimposition ratio of the road map data image after the traveling direction of the vehicle is changed to the road map image data before the road map data image is changed as the time has passed from 10 : 0 to 0 : 10.

10. A display apparatus for an automotive vehicle, as claimed in claim 1, wherein the display control section varies the display form in such a manner as to synchronize

a rotation of a field of view in a driving direction of the vehicle with that of the road map image data for the road map image to be displayed on the image screen of the road map data image.

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11. A display apparatus for an automotive vehicle, as claimed in claim 1, wherein the display control section comprises a vehicular traveling route direction predicting section that predicts a direction of a traveling route of the vehicle and wherein, when the direction of the traveling route of the vehicle is varied through an angle equal to or wider than a predetermined angle, the display control section rotates the road map data image with the image of the vehicle as a center on the basis of a predicted data on the direction of the traveling route of the vehicle varied through an angle equal to or wider than the predetermined angle.

12. A display apparatus for an automotive vehicle, as claimed in claim 11, wherein the vehicular traveling route direction predicting section predicts the direction of the forwarding route of the vehicle on the basis of at least one of the following data: (a) a comparison data comparing the present traveling direction of the vehicle read from the road map data image with a forward bend situation of the present traveling direction; (b) a data on a preset guide route; and (c) a data on a winker operation of the vehicle.

13. A display apparatus for an automotive vehicle, as claimed in claim 11, wherein the display control section varies the display form of the displayed image screen at an earlier timing than a turning start timing of the vehicle.

14. A display apparatus for an automotive vehicle, as claimed in claim 11, wherein the display control section returns the display form of the displayed image screen on the image display section to an original state at a time point earlier than a timing at which the vehicle has ended a turning.

15. A display apparatus for an automotive vehicle, as claimed in claim 11, wherein the display control section varies the display form of the displayed road map data image on the image screen of the image display section after a timing at which the vehicle starts to turn and returns the varied display form to the original state after a timing at which the vehicle has ended the turning.

16. A display apparatus for an automotive vehicle, comprising:

- image display means;
- present position measuring means for measuring a present position of the vehicle;
- road map storing means for storing a road map data image;
- superimpose processing means for superimposing a mark representing the present position of the vehicle on the road map image to display the road map data image on which the mark is superimposed through the image display section; and
- display control means for rotating the road map data image displayed on an image screen of the image display section in accordance with a traveling direction of the vehicle and for varying a display form of the displayed road map data image between a region of the road map data

image which is near to a displayed position at which the vehicle is present and another region of the road map data image which is remote from the displayed position thereof when rotating the road map data image on the image screen
5 displayed on the image display section.

17. A display method for an automotive vehicle, comprising:

providing an image display section;
10 measuring a present position of the vehicle;
storing a road map data image;
superimposing a mark representing the present position of the vehicle on the road map data image to display the road map data image on which the mark is superimposed
15 through the image display section;
rotating the road map data image on an image screen of the image display section in accordance with a traveling direction of the vehicle while displaying the road map data image on an image screen of the image display section; and
20 varying a display form of the displayed road map data image between a region of the road map data image which is near to a displayed position at which the vehicle is present and another region of the road map data image which is remote from the displayed position thereof while rotating
25 the road map data image on the image screen of the image display section.

18. A display apparatus for an automotive vehicle, as claimed in claim 2, wherein the display control section
30 varies the display form in such a manner as to synchronize a rotation of a field of view in a traveling direction of the vehicle with that of the road map image data for the road map image to be displayed on the image screen of the

road map data image.

19. A display apparatus for an automotive vehicle, as
claimed in claim 3, wherein the display control section
5 comprises a vehicular traveling route direction predicting
section that predicts a direction of a traveling route of
the vehicle and wherein, when the direction of the traveling
route of the vehicle is varied through an angle equal to
or wider than a predetermined angle, the display control
10 section rotates and displays the road map data image with
the image of the vehicle as a center on the basis of a predicted
data on the direction of the traveling route of the vehicle
varied through an angle equal to or wider than the
predetermined angle.

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